

ANAEMIA RELATED KNOWLEDGE & DIETARY PRACTICES AMONG ADOLESCENT HIGH SCHOOL GIRLS IN RURAL AREAS OF MANDYA DISTRICT

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Abstract

Background: Adolescence is the period of most rapid growth second to childhood. Anaemia in the adolescence causes reduced physical and mental capacity and diminished concentration in work and educational performance, and also poses a major threat to future safe motherhood in girls. Considering these factors, the present study was conducted with the aim of assessing the knowledge of adolescent high school girls in rural areas of Mandya regarding various aspects of anaemia and to assess their anaemia related dietary practices.

Methodology: This school based cross sectional descriptive study was conducted between November 2022 and April 2023, in 6 schools of rural areas of Mandya District. All the students of the high school, who fulfilled the inclusion – exclusion criteria participated in the study. Data was collected by interview method, using a semi-structured questionnaire. Results of the analysis of the collected data was presented as frequency and proportions.

Results: Many participants (>50%) had knowledge regarding the various aspects of anaemia, including its causes, risk factors, complications, treatment, etc. Many did not know regarding the iron rich foods and foods that help combat anaemia. Their dietary practices with regard to iron rich food items was found to be poor. **Conclusion:** Although the participants have some knowledge regarding anaemia, lacunae were found in their knowledge in varied aspects regarding anaemia and dietary practices.

Key Words: Anaemia, Knowledge, Adolescent girls, High school, Rural, Dietary practices

Introduction

Adolescence is the phase of life between childhood and adulthood, from ages 10 to 19. It is a unique stage of human development and an important time for laying the foundations of good health. Adolescents experience rapid physical, cognitive and psychosocial growth. This affects how they feel, think, make decisions, and interact with the world around them. ^[1]

There are more adolescents in the world than ever before: 1.2 billion, totaling one sixth of the global population. This number is expected to rise through 2050, particularly in low- and middle-income countries. ^[2]

Adolescence is a significant period for physical growth and sexual maturation. Poor nutrition during adolescence can impair the work capacity and productivity of adolescent girls in their later years. Further, an under nourished girl is at the risk of developing complications during pregnancy and the chances of her giving birth to a low-birth-weight baby increases, thus perpetuating a vicious cycle of malnutrition and ill-health. ^[3] In many cultures around the world, women and girls often eat last and eat least. As a result, women and girls represent 60% of all undernourished people globally.

Malnutrition, along with other factors, such as poverty, gender barriers, and social and cultural norms, contributes to 130 million girls being out of school. Even when girls are in school, anaemia can hold them back from academic achievement and potential future economic empowerment. ^[4]

Menstruation increases the nutritional needs of adolescent girls for iron and other micronutrients related to growing bone and muscle mass, including calcium, zinc, and vitamins A and D.

Adolescents tend to eat differently than they did as children. Preoccupied with after-school activities and engagement in active social endeavors, adolescents are not always able to sit down for three meals a day. Poor eating habits during the critical adolescent years may lead to both short- and long-term health consequences including obesity, osteoporosis, and sexual maturation delays. Adolescents are at risk of obesity, obesity-related chronic diseases, and eating disorders. ^[5]

While studies have been done on prevalence, knowledge and dietary aspects of anaemia; not many have explored the perceptions of anaemia holistically that included the awareness regarding various aspects of anaemia and has captured the diet of the participants. Considering these factors, this study was undertaken with the objectives of assessing the knowledge of adolescent high school girls regarding various aspects of anaemia and to assess their anaemia related dietary practices.

Methodology

This study was conducted from November 2022 to April 2023 (6 months) in 6 high schools located in rural areas of Mandya district and was conducted amongst high school girls residing in rural areas for more than a year. Sample size was calculated using $4pq/d^2$. ^[6] According to the National Family Health Survey 5 conducted in 2021-22, the prevalence of anaemia among adolescent girls was found to be 59.1%. ^[7] The minimum sample size was calculated to be 278. Totally 300 students of the schools became eligible to participate in the study as per the inclusion exclusion criteria. Hence the final sample size was 300 participants. Six high schools were randomly chosen in the rural areas of Mandya. The permission to

conduct the study was sought from the administration of the schools. The girls studying in high school, that is 8th, 9th and 10th standard were enumerated. Together the total enumeration of high school girls was 300.

Inclusion criteria includes a girl studying in high school who gives informed assent to participate in the study and has informed consent of her parent consenting for her to participate in the study. Those high school girls living in rural areas of Mandya for less than a year were excluded from the study. Ethical clearance was taken from IEC, MIMS, Mandya. The student was interviewed using a pretested, semi-structured questionnaire.

Results

In this study, Out of 300 adolescent girls 266 (88.67%) knew anaemia as decrease in blood/Haemoglobin/iron in blood. Among them, 180 (60%) considered anaemia as major health problem, whereas 82 (27.33%) considered it as not a major health problem. Children were considered as more susceptible to develop anaemia by 96 (32%) participants, Elderly by 62 (20.67%), women of reproductive age group by 44 (14.67%), Pregnant women by 40 (13.33%), only 22 (7.33%) participants knew that adolescents are also more susceptible for developing anaemia, 52 (17.33%) mentioned that persons with chronic illness, alcoholics and those who are undernourished as more susceptible to anaemia.

Table 1: Knowledge Regarding anaemia among Adolescent Girls (N=300)

Knowledge regarding anaemia	N	%
Have you heard of Anaemia	266	88.67
How big of a health problem is anaemia?		
Big problem	180	60.00
Not a big problem	82	27.33
Do not know	38	12.67
Which group of persons are more likely to have anaemia?		
Children	96	32.00
Elderly	62	20.67
Pregnant women	40	13.33
Women of Reproductive age group	44	14.67
Adolescents	22	7.33
Others	52	17.33
What symptoms does an anaemic person have?		
Weakness/Tiredness	210	70.00
Pallor	96	32.00
Breathing difficulty	40	13.33
Memory loss/Impaired cognition	20	6.67
Palpitation	8	2.67
What are the complications of anaemia?		
Affects Heart & Lung (heart failure & Lung failure)	82	27.33
Susceptible to infection	58	19.33
Death	54	18.00

Pregnancy complications:	14	4.67
Others	34	11.33
How can one find out if a person has anaemia?	214	71.33
What treatment does the doctor give to a person having anaemia?		
Iron tablets	118	39.33
Vitamin supplements	56	18.67
Others	62	20.67

Note: Participants have given multiple responses for these questions

Nearly 210 (70%) participants knew weakness/tiredness/fatigue as one of the symptom in person having anaemia, 96 (32%) of them knew that person with anaemia presents with pallor/paleness of skin, 40 (13.33%) participants knew person with anaemia can have breathing difficulty, 20 (6.67%) of them also knew that person with anaemia also presents with Memory loss/impaired cognition, 8 (2.67%) considered palpitation as symptom of anaemia.

In this study, 82 (27.33%) participants knew that anaemia can lead to decreased functioning of heart and lungs, 58 (19.33%) knew that it can make person susceptible for infection, 54 (18%) knew, if anaemia is not treated it can lead to death/be fatal, 34 (11.33%) participants considered anaemia if not treated can lead to irregular menstruation, hormonal imbalance, restless leg syndrome etc.

Out of 300, 214 (71.33%) participants knew that anaemia can be diagnosed by Blood test/Haemoglobin estimation/RBC count. In this study, 118 (39.33%) participants knew that when a person having anaemia seeks health care, he/she will be provided with iron tablets/supplementation, 56 (18.67%) participants knew that a person with anaemia is also treated with vitamin supplements like Vitamin B12, Folate and Vitamin C, 62 (20.67%) participants considered that person having anaemia will be treated with blood transfusion and also provided with dietary advice to consume diet rich in Iron.

Table 2: Dietary practices among Adolescent Girls (N=300)

Dietary regarding anaemia	N	%
What foods items should one eat, so that they do not get anaemia?		
Green Leafy Vegetables	160	53.33
Meat	70	23.33
Fruits	180	60.00
Other Vegetables	128	42.67
Others	24	8.00
What are things one should do, so that they do not get anaemia?		
Balanced/Proper diet	228	76.00
Hand hygiene	18	6.00
Prophylactic IFA	2	0.67
Deworming	0	0.00
Wear slippers	0	0.00
Others	28	9.33

Note: Participants have given multiple responses for these questions

In food items, 160 (53.33%) participants knew that consuming green leafy vegetables can help in prevention of anaemia, 180 (60.00%) participants knew that consumption of fruits like citrus fruits can help in prevention of anaemia, 128 (42.64%) of the participants considered consumption of other vegetables apart green leafy vegetables can also help in prevention of anaemia, 24 (8%) knew that consumption of other food items like ragi, cereals and pulses, jaggery and also fortified foods can help in prevention of anaemia.

Nearly 228 (76%) of the participants considered, consumption of regular, proper and balanced diet can help in person reduce the risk of developing anaemia, only 18 (6%) participants knew about the role of hand hygiene in reducing the risk of developing anaemia. Only 2 participants knew about the prophylactic Iron Folic Acid (IFA) therapy given for prevention of anaemia. Few others considered that avoidance of consumption of tea after meal can help in prevention of anaemia.

Discussion

A total of 300 adolescent high school girl students participated in the study. More than a third were 13-year-olds a third were 14-year-olds. A little less than a quarter of them were aged 15 years and very few were 12 & 16 years. Nearly 88% of the participants knew that anaemia as disease pertaining to decrease in blood, but remaining students immediately understood the meaning of anaemia when it was told in Kannada, that is "raktha heenathe". Hence there was no exclusions due to the participants not knowing what anaemia is.

In our study we found that, 60% of them identified anaemia as a big problem. In a study by Singh *et al.*, 83% of the participants identified anaemia as a big problem.^[8] Regarding risk groups, they identified children (32%), Elderly (21%), pregnant women (13%), women of reproductive age group (15%) and only few knew that even adolescent girls are at higher risk of anaemia(19%).

Regarding symptoms of anaemia, in our study participants identified persistent tiredness or weakness (70%), pallor/paleness of skin (32%), easy onset of breathlessness (13%), memory loss or impaired cognition (7%) and palpitations (3%). Other studies showed that correct knowledge regarding symptoms were known by 81%,^[9] and 45%.^[10] In one study the symptoms mentioned were decreased appetite (33%), fatigue (27%), irritability (35%), shortness of breath (30%) and pale skin (70%).^[8]

Regarding complications of anaemia, about a quarter of the participants identified heart problems and lung problems as complications of anaemia. One in 5 participants knew that it can also make a person susceptible for infections and eventually lead to death due to complications. Very few participants knew that it can also lead to decreased growth & development and learning abilities. Singh *et al.* study participants answered decreased growth & development (47%), learning abilities (27%) and decreased working capacity (28%).^[8]

Nearly 71% of our participants knew that anaemia could be diagnosed by blood test. Regarding treatment of anaemia, only 39% knew about iron tablets. Only one-fifth of the participants knew about deworming and vitamins as a part of treatment of anaemia. While one studies show a knowledge of only 6% regarding iron in the treatment of anaemia,^[10] another study showed the knowledge to be 78%. Vitamins and deworming were mentioned by 28% and 27% of them.^[8]

While 76% told that having a balanced diet prevented anaemia, fruits were mentioned by 60%, followed by leafy vegetables (53%), other vegetables (42%), less than 8% knew about

other sources of food which can prevent anaemia. The study by Verma *et al.* found that 88% knew that iron rich foods should be consumed but only 15% knew what those foods were.^[9] Kakkar *et al.* found that 58% participants knew about prevention of anaemia.^[11]

A quarter of our study participants knew that eating meat prevented anaemia while one in five mentioned milk and egg. Very few mentioned particularly about Liver as rich source of iron. Regarding practices that affected anaemia, only 6% of the students knew hand hygiene as a healthy practices that can prevent anaemia, none knew about the importance of wearing footwear, prophylactic Iron & Folic acid supplementation and deworming in preventing anaemia. Participants were aware regarding the treatment aspect whereas not aware that the same can also be used as preventive measures. Very few (<10%) knew alcohol consumption smoking and caffeine can increases risk of anaemia. Arohi C, *et al.* found that 97% of their adolescent participants thought that inadequate diet was to blame for anaemia but only 10% knew about other micronutrients, anaemia prevention was known by 46% and coffee-tea was blamed by 17%. Iron-folate tablets were voiced by 13%.^[10] While 64% of Verma *et al.* study participants of knew about anaemia prevention, only 15% knew about iron rich foods.^[9]

When compared to the balanced diet as per the Indian Council of medical Research and National Institute of Nutrition (ICMR-NIN) recommendations of 2020, the sources of iron were calculated from food frequency questionnaire of food items that contributed iron content significantly to our needs. The complete calculation of iron content of all the foods consumed would have been ideal and is the inadequacy of this study. However, it was found that 76% of the participants received the estimated average requirements from these sources alone. In addition, many were consuming foods that helped iron absorption and helped fight anaemia. A study done in Bengaluru had found that the diet of 69% of adolescent girls had inadequate iron content, in another study done in Bhopal inadequate intake of leafy vegetables and non-vegetarian foods by adolescent school girls were identified, similar finding were reiterated by Upadrasta *et al.*^[11-13]

Strengths

As the study was conducted in 5-6 randomly selected high schools of rural areas of Mandya district, this study can be generalised to high school girls of rural areas.

Limitations

As the objective of the study was only to assess the knowledge, attitude and practices of adolescent girls pertaining to nutritional anaemia, the burden of anaemia at rural areas could not be assessed with this study design and study setting. This study also confined only to adolescent girls studying in high schools, but those girls who were dropped out from the school were not included in the study.

Conclusion

Majority of the participants knew what is anaemia, but very few had correct knowledge regarding treatment and preventive aspects of anaemia, also there was lacunae in intake of iron rich food. Fortification of food items helps in combating nutritional anaemia, also poses risk of excess iron intake. Nutritional assessment through counselling and health education of adolescent girls and their parents/guardians is very much essential as family play a very important role in health of adolescents. Adequate knowledge and accessibility for food that are locally grown and naturally rich in iron can overcome both the issues.

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